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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,787	12/28/2001	Satoshi Niiyama	217911USOCIP	2834

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EXAMINER	
DUONG, THOI V	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,787	NIIYAMA ET AL.	
	Examiner	Art Unit	
	Thoi V. Duong	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,6,11-23,27 and 28* ~~is~~/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,6,11-23,27 and 28* ~~is~~/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/847,333.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 13, 2006 has been entered.

Accordingly, claims 1, 5, 14-17 and 19-22 were amended, and claims 3, 4, 7-10 and 24-26 were cancelled. Currently, claims 1, 2, 5, 6, 11-23, 27 and 28 are pending in this application.

Priority

2. This application appears to be a continuation-in-part of Application No. 09/847,333, filed May 3, 2001.

Allowable Subject Matter

3. The indicated allowability of claims 3, 7, 14-17, and 19-22 from the previous office action is withdrawn in view of the newly discovered reference(s) to Unno et al. (US 6,233,027 B1). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 11-14, 16-18 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, US 5,453,863) in view of Unno et al. (Unno, US 6,233,027 B1).

Re claim 1, as shown in Fig. 1, West discloses a chiral nematic liquid crystal optical element (col. 6, lines 48-52), comprising:

a pair of substrates 10 and 11 with transparent electrodes 13 (col. 6, lines 35-39); and

a liquid crystal layer 16 having a memory property (having the textures being stable in the absence of a field) interposed between the substrates (col. 4, lines 25-35);

a first resin layer 14 (upper resin layer) which is provided on one of the transparent electrodes 13 (upper transparent electrode) (col. 6, line 66 through col. 7, line 9),

said first resin layer having a rubbed vertical (or homeotropic) alignment surface in contact with the liquid crystal layer 16 (col. 3, lines 16-24; col. 7, lines 1-6; and col. 14, lines 35-37);

a non-alignment layer of a second resin layer 14 (lower resin layer), or a vertical alignment layer of a second resin layer 14 which is provided between the liquid crystal layer and the other of the transparent electrodes (the lower transparent electrode 13 in Fig. 1) (col. 7, lines 1-6; col. 8, lines 15-19; col. 9, Table II, examples 16 and 20 and Table III, examples 34 and 37; and col. 14, lines 35-37),

wherein said liquid crystal layer exhibits a planar state as shown in Fig. 4 and a focal conic state as shown in Fig. 3 (col. 4, lines 25-35; col. 10, lines 42-59; and col. 11, lines 26-34).

However, West does not disclose that the second resin layer has a surface hardness of B of less in a pencil hardness test.

As shown in Fig. 2, Unno discloses a liquid crystal display device 21 comprising a first resin layer 12 (rubbed polyimide) (col. 5, lines 44-47) and a non-alignment layer 22 (photoelectric conversion semiconductor layer) comprising a second resin layer 25 (a charge transportation layer), which is provided between the liquid crystal layer 13 and the transparent electrode 5 (col. 3, lines 20-28 and 37-48; and col. 3, line 66 through col. 4, line 4),

wherein the second resin layer 25 has a surface hardness of 2B of harder so as to control the gap size accurately (col. 6, lines 28-33); this meets the claimed surface hardness of B or less in a pencil hardness test.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal optical element of West with the teaching of Unno by forming a second resin layer having a surface hardness of B of less in a pencil hardness test in order to accurately control the gap size of the display (col. 6, lines 28-33).

Re claim 2, Fig, 2 of Unno shows that the first resin layer 12 is provided only on the substrate 3 on a side opposite to an observing side OB.

Re claim 11, as shown in Fig. 3, West discloses that said focal conic state produces a scattering of incident light (col. 10, lines 53-59 and col. 11, lines 26-34).

Re claim 12, as shown in Fig. 4, West discloses that said planar state produces a selective reflection of incident light (col. 9, line 63 through col. 10, line 53).

Re claim 13, the liquid crystal optical element of West is a color display (col. 2, lines 10-13).

Re claim 14, West discloses that the second resin layer comprising a polyimide (col. 6, line 66 through col. 7, line 5), and the baking process for polyimide is well known in the art as disclosed by Unno for curing the material (col. 16, lines 7-59).

Re claim 16, Unno discloses that the second resin layer is a non-alignment layer of a resin surface 22f shown in Fig. 2 (col. 3, lines 42-44).

Re claim 17, since the structure recited in the reference is substantially identical to that of the claims, claimed functions are presumed to be inherent (see MPEP 2112.01 [R-2]); therefore, the second resin layer of Unno having a pencil hardness of 2B also prevents image-sticking.

Re claim 18, as shown in Fig. 4, West discloses that the liquid crystal molecules 40 have a planar structure parallel to the cell wall and exhibit maximum reflectivity; accordingly, it is obvious that the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror (col. 10, lines 43-51).

Re claim 27, West discloses that the rubbed vertical alignment does not twist the liquid crystal at 240 degrees since, according to examples 17 and 18 in Table II where the PVF coatings on opposites substrates are rubbed parallel and perpendicular to each

other, the rubbed vertical alignment surface twists the liquid crystal at 90, 180, 270 or 360 degrees.

6. Claims 5, 19, 21-23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Unno et al. (Unno, US 6,233,027 B1) and Konuma et al. (Konuma, USPN 5,856,853).

Re claim 5, as shown in Fig. 1, West discloses a chiral nematic liquid crystal optical element (col. 6, lines 48-52), comprising:

a pair of substrates 10 and 11 with transparent electrodes 13 (col. 6, lines 35-39); and

a liquid crystal layer 16 having a memory property (having the textures being stable in the absence of a field) interposed between the substrates (col. 4, lines 25-35);

a first resin layer 14 (upper resin layer) which is provided on one of the transparent electrodes 13 (upper transparent electrode) (col. 6, line 66 through col. 7, line 9),

said first resin layer having a rubbed vertical (or homeotropic) alignment surface in contact with the liquid crystal layer 16 (col. 3, lines 16-24; col. 7, lines 1-6; and col. 14, lines 35-37);

a non-alignment layer of a second resin layer 14 (lower resin layer), or a vertical alignment layer of a second resin layer 14 which is provided between the liquid crystal layer and the other of the transparent electrodes (the lower transparent electrode 13 in Fig. 1) (col. 7, lines 1-6; col. 8, lines 15-19; col. 9, Table II, examples 16 and 20 and Table III, examples 34 and 37; and col. 14, lines 35-37),

wherein said liquid crystal layer exhibits a planar state as shown in Fig. 4 and a focal conic state as shown in Fig. 3 (col. 4, lines 25-35; col. 10, lines 42-59; and col. 11, lines 26-34).

However, West does not disclose that the second resin layer has a surface hardness of B of less in a pencil hardness test and a metal oxide layer is provided on at least one of the transparent electrodes.

At first, as shown in Fig. 2, Unno discloses a liquid crystal display device 21 comprising a first resin layer 12 (rubbed polyimide) (col. 5, lines 44-47) and a non-alignment layer 22 (photoelectric conversion semiconductor layer) comprising a second resin layer 25 (a charge transportation layer), which is provided between the liquid crystal layer 13 and the transparent electrode 5 (col. 3, lines 20-28 and 37-48; and col. 3, line 66 through col. 4, line 4),

wherein the second resin layer 25 has a surface hardness of 2B of harder so as to control the gap size accurately (col. 6, lines 28-33); this meets the claimed surface hardness of B or less in a pencil hardness test.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal optical element of West with the teaching of Unno by forming a second resin layer having a surface hardness of B of less in a pencil hardness test in order to accurately control the gap size of the display (col. 6, lines 28-33).

Further, as shown in Fig. 1, Konuma discloses a liquid crystal display comprising a transparent electrode 8 and a metal oxide film 9 (short-circuit preventing film) provided

on the transparent electrode 8 to prevent short-circuiting (see Abstract; col. 3, lines 57-60; and col. 5, lines 1-6).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Konuma by providing a metal oxide layer provided on at least one of the transparent electrodes to prevent short-circuiting and improve contrast (see Abstract and col. 5, lines 52-57).

Re claim 19, West discloses that the second resin layer comprising a polyimide (col. 6, line 66 through col. 7, line 5), and the baking process for polyimide is well known in the art as disclosed by Unno for curing the material (col. 16, lines 7-59).

Re claim 21, Unno discloses that the second resin layer is a non-alignment layer of a resin surface 22f shown in Fig. 2 (col. 3, lines 42-44).

Re claim 22, since the structure recited in the reference is substantially identical to that of the claims, claimed functions are presumed to be inherent (see MPEP 2112.01 [R-2]); therefore, the second resin layer of Unno having a pencil hardness of 2B also prevents image-sticking.

Re claim 23, as shown in Fig. 4, West discloses that the liquid crystal molecules 40 have a planar structure parallel to the cell wall and exhibit maximum reflectivity; accordingly, it is obvious that the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror (col. 10, lines 43-51).

Re claim 28, West discloses that the rubbed vertical alignment does not twist the liquid crystal at 240 degrees since, according to examples 17 and 18 in Table II where

the PVF coatings on opposites substrates are rubbed parallel and perpendicular to each other, the rubbed vertical alignment surface twists the liquid crystal at 90, 180, 270 or 360 degrees.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Unno et al. (Unno, US 6,233,027 B1) and Konuma et al. (Konuma, USPN 5,856,853) as applied to claims 5, 19, 21-23 and 28 above, and further in view of Gotoh et al. (Gotoh, USPN 5,674,576).

The chiral nematic liquid crystal optical element of West as modified in view of Unno and Konuma above includes all that is recited in claim 6 except for a drive voltage of 20V or less applied across the paired transparent electrodes.

As shown in Fig. 1, Gotoh discloses a chiral nematic liquid crystal optical element comprising a pair of electrodes 12 driven by a low applied voltage to realize excellent hysteresis characteristics (col. 2, lines 23-26). According to examples 1-11, the applied drive voltage is less than 20V (cols. 11-17).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Gotoh by applying a low voltage of less than 20V across the pair electrodes in order to obtain excellent hysteresis characteristics (col. 2, lines 23-26).

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Unno et al. (Unno, US 6,233,027 B1) as applied

to claims 1, 2, 11-14, 16-18 and 27 above, and further in view of Khan et al. (Khan, USPN 6,377,321 B1).

West in view of Unno discloses a chiral nematic liquid crystal optical element that is basically the same as that recited in claim 15 except for a first electrically insulating layer coated on at least one of the electrodes and a second electrically insulating layer coated on the other electrodes, wherein said first and said second electrical insulating layers are coated on said electrically insulating layers.

As shown in Fig. 6, Khan discloses a chiral nematic liquid crystal optical element 42 comprising electrodes 56 and insulating layers 58 (passivation layers) coated on the electrodes to prevent front to back shorting of the electrodes, wherein alignment layers 60 are coated on said electrically insulating layers (col. 11, lines 42-67; col. 14, lines 1-6; and col. 17, lines 1-18).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Khan by coating the insulation layers on the electrodes to prevent front to back shorting of the electrodes (col. 11, lines 50-52).

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (West, USPN 5,453,863) in view of Unno et al. (Unno, US 6,233,027 B1) and Konuma et al. (Konuma, USPN 5,856,853) as applied to claims 5, 19, 21-23 and 28 above, and further in view of Khan et al. (Khan, USPN 6,377,321 B1).

West in view of Unno and Konuma discloses a chiral nematic liquid

crystal optical element that is basically the same as that recited in claim 20 except for a first electrically insulating layer coated on at least one of the electrodes and a second electrically insulating layer coated on the other electrodes, wherein said first and said second electrical insulating layers are coated on said electrically insulating layers.

As shown in Fig. 6, Khan discloses a chiral nematic liquid crystal optical element 42 comprising electrodes 56 and insulating layers 58 (passivation layers) coated on the electrodes to prevent front to back shorting of the electrodes, wherein alignment layers 60 are coated on said electrically insulating layers (col. 11, lines 42-67; col. 14, lines 1-6; and col. 17, lines 1-18).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the chiral nematic liquid crystal optical element of West with the teaching of Khan by coating the insulation layers on the electrodes to prevent front to back shorting of the electrodes (col. 11, lines 50-52).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached at (571) 272-1787.

Thoi V. Duong

04/20/2006